FERENC GLATZ

Information Society

The Nature of Industrial-Technological Revolutions

We are living out our days in an age of industrial-technological revolutions. Today, everyone accepts the truth of this statement. It is also true that there are continuing arguments about the nature of this new phenomenon, whether it is "only" a new wave of the first industrial-technological revolution of the 18th – 19th centuries, that has been going on unabated ever since, or rather it represents an independent period. There are also ongoing arguments about the issues of what are the specific aspects of industrial revolutions; are these vested in the new materials used in production and in the culture of tools (iron, plastics, etc), or the energy used (steam, petrol, electricity, atom)? Or whether the industrial-technological revolution should be understood in terms of changes in technology only, representing revolutionary alterations in the principles of shaping raw materials and production-methods (such as the age of machinery).

As a student of the evolution of society and of the history of everyday life, I have been teaching about the industrial-technological revolution in a different way for decades. And let me add; I also evaluate the current, new revolution differently than many others.

Mutual Relations Between Human Beings and Technology

I consider the industrial-technical revolution as a social and cultural revolution.

It is true that the industrial revolution began in the 18th century with the invention of new technical processes of the production of goods (even this assertion is disputable because "technical innovation" means, at the same time, "innovation in thinking.") The technical inventions of the 18th century were the consequences of innovative thinking; they would have been impossible without the revolution of mass-culture in the 16th–17th century (the printing of books accompanied by an explosion of knowledge). In other words, the new technology, the "industrial moment," cannot be understood without its "human" component.

I often ask myself, "Where is the starting point in all this?" Is it at the point of the evolution of the human being, an individual living a spiritual life, or at the development of the new technical units (such as a machine)? Or at the point of the innovative application of energy sources (such as steam)? I myself – in oppo-

Begegnungen
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sition to the writers of the majority of our history books – do not place them in ranks of order, but speak, instead, of interactions. For example, without the general explosion of knowledge Watt's steam engine could not have been invented, neither could the many inventions of the 18th and the 19th centuries could have come about. (One of the outstanding historians of our century tried to prove, in a lengthy study, that the machine as a technical unit was preceded by the development of the concept of "machinery." Consequently, the practical construction of *the* machine itself is only the task for the technician. Or as a current engineering professor teaches about the "order of ranking;"first experience, then idea, then tools, then experience again, new idea, new tools; their close interrelationship leads to new applications. In other words, the practical use of a fallen tree as a roller leads to the transportation of a load; from this natural roller an artificial one, the wheel, is developed... and there are numerous other examples for this process.) However, no matter what position one takes in this dispute, for me it is a fact that one cannot consider the industrial-technological revolution as merely a "technological" process. Neither the industrial-technological revolution of a couple of hundred years ago, nor the one taking place today should be considered as such. Why?

When we examine the history of technical innovations in society, and the availability and use of tools, we will discover that significant innovations remained incomplete, and were even forgotten, if society were unwilling to use them. Such innovations had not contributed to the further evolution of thinking. For instance, we know that in China many inventions in physics and chemistry were introduced long before they were used in European culture. The Chinese knew about gunpowder and rockets. However, these technological inventions did not become a starting point or, for that matter, parts of a continuous industrial-technological revolution. Why? Because the medium, the people, who would have recognized the social significance of the inventions were absent. The invention, the idea, was isolated from society. It was the emergence of a caste-based society in China that prevented the *absorption* or *assimilation* of the innovations. (A Hungarian historian of technology rightly observed that it was not accidental that ideas emerging in Hungary were realized in Germany or in the United States, and it is equally not an accident that Hungarian Noble-prize winners – with one exception – developed their inventions in German or American environments.)

As I mentioned above, the technical innovations of craftsmen and later of engineers in Europe, were the outcome of a general *revolution in thinking*. At the same time, these innovations were a starting point of new social usages, a social transformation. The foundation of this *mutual relationship* is rooted in the typical developmental characteristics of European society. In fact, this society, based on Judeo-Christian principles, had never lost its mobility. It is true that this society was based on various ideological elements (property, politics, religion), on social

classes, strata and interest groups. However, mutuality (solidarity) and mobility have remained characteristic of European society for a thousand years and these elements have been its moving and driving forces all this time.

Society had to be willing and able to assimilate the "machine," or the new technology. The new production process – and all that it implied; new materials, new processes/technologies of working a given material, new organization of firms, and a new method of training, directed at the masses – could become challenges for new social processes. To illustrate this with a concrete example people in the 19th century created, out of necessity, new forms of settlements because the new unit of a firm – for example, the factory – demanded continuous cooperation and dwellings located closer to the places of work and new, unified bases for training and disciplined thinking. In addition, I am inclined to deduce the development of the well springs of the European mother-tongues and of the national units from the needs of an industrial society, that is, from the originality and the new organization of work and settlement system. In a large factory, for example, – which has been the classical unit of industrial production – the workers had to understand instructions exactly as they were given. There was also need for means of uniform communication corresponding to exact production norms, for a constantly reinvented modernizing language. *Modern production methods, modern directions*, modern industrial society – in which large numbers of *people live in a close community,* communicate with each other quickly and more often in a day than they did in the past in months, – this industrial-technological revolution forced the *renewal and standardization* of national languages on the continent. This was the process that brought about the development of norms of information-exchange, without which neither mass production methods, nor the modern administration of the masses could have been organized...

We must study the "human factor" in the production processes more intensively. We must discover the fact that the new production methods not simply "affect" human thinking, but the process itself constantly changes as a consequence of the constantly curious, evolving human brain. (The curiosity of the masses, the will to renewal, are also a characteristic of our culture.) There is a mutual relationship between a piece of work and the worker, between the *material and the technology* and the man involved. This relation exists on the individual as well as on the societal level.

The New Synthesis of Natural and Social Sciences

Consequently, we should regard the industrial-technological revolution not only through the machines and technological innovations it creates, but also through the development of the human spirit, the process of the self-renewal of human society. In this self-renewal immobile matter is but the means. The means is –

technology – the goal is the renewal of the human spirit. These two factors cannot be separated. Perhaps, one day we might abandon our one-sided concept of life, consisting of scrambling for material goods. And we might also respect more in ourselves and in our neighbours – and as a subject for research – the man who is creating a community alongside the one who produces the goods, the man who lives a spiritual life, is a member of a family, partakes in simple human happiness and enjoys the beauty of the world.

Unfortunately, such *interrelations* are not readily noticed in our world. I ask myself, why? Perhaps because the practitioners of technology and the so-called "lifeless" natural sciences have been gradually separated from sociological knowledge? It is possible. But the reverse of this is also certainly true; the practitioners of social sciences utterly lack knowledge of the natural sciences. And I have the courage to state; university-academic unions and other institutions safeguarding particular interests force the confrontation of *the two types of knowledge.*

It is undoubtedly true that the great successes of technology and the natural sciences in the 20th century created an impression that the basis of human progress may be found exclusively in the practices of the natural sciences. Consequently, we have created a system of goals and values for mankind in which material goods (money, technical gadgets) became the determining factors. On the other hand, we researchers, have neglected the human-emotional elements in our own everyday lives. We do not spend enough time on them. I repeat; we have become members of a large firm in which we constantly invent impact-factors in the interest of more and more production. Therefore, we underestimate the *homo ludens* in ourselves. Yet, without it, we human beings would be lacking ideas, be without emotions, and would be simply products of biochemistry. This would be true for researchers as well as for producers. In general, we underestimate the human being who "builds society." Similarly, we underestimate the significance of research dealing with such matters; that is, the social sciences. And I ask myself; "isn't it also true that, on the other hand, there is disparagement of technical culture, almost on a 'medieval' pattern?" Technology is being considered as simply a means for the production of "articles" that in the creation of society (and in politics) is "only" secondary. People thinking this way cannot see that in the world of articles (in a machine or a useful tool) the human spirit is embodied just as much as it is present in the creation of an art work or in a political-military action that is thought out with finesse. I am able to enjoy the sight of a marvellous spiral house of a snail or a gnarled axle or gears that cling and hold together with marvellous precision. It gives me pleasure just as a soundtrack of Bartók does with its seven notes.

We have been urging the creation of a new synthesis in world view, in the practice and organization of research, for years. It seems that the consequence of the separation of the systems of ideas is that only such creations receive recogni-

tion that fit into the separate hierarchies and their specific community of research goals. Minds that work for a new synthesis or want to revive the "completeness" of views that had existed at the beginning of the 20th century – will find themselves outside the daily workings of their disciplines. The development of the new information revolution now demands the elimination of the deficit of the previous century.

This is the way I view the history of the 19th – 20th centuries as a scholar and researcher of the relations between "man and nature," and the subject of "man and the artificial and natural environment." I consider the history of our days from a similar viewpoint, including the industrial revolution. The latter is being considered by many as an informational revolution, and I think of it similarly. What, in fact, is happening in these days?

The Information Revolution in Eastern Europe

The scientific and technological as well as the social revolution were responsible for the collapse of the Soviet system. It failed as a military-strategic unit, as well as a social-organizational system, because it was unable to assimilate changes. Our historical studies do not yet emphasize this fact. The invention and development of semi-conductors, the chip, micro-technology, the news- and information transmitting systems, undermined not only the organization of production and that of work in Hungary, but also the existing social formations. The technical changes contributed to the democratization of political organizations in the region faster than any radical political force in the last century-and-a-half. From one day to the next, these changes made events happening in the community a part of every citizen's life.

The forces of the new scientific-technological revolution gradually undermine the system of territorial organizations on the continent including those in Eastern Europe. After the Soviet collapse, they helped to speed up the *integration* of the region, a process under way for several centuries. The world-system, created in the first half of the 19th century, is now in dissolution. This process and the development of new production-community forms will mostly determine future directions in our region. It questions the basic principles of the organization of the nation states and, at the same time, will change the current role of the state. It will arrange the hierarchy of relations connecting the individual to the community; it will relegate the one-sided primacy of citizen identification and replace it with new identifications of social, national, religious, or generational affinities. In other words, the informatics-information revolution will engender the *birth of a new society.*

Globalizing tendencies are also being strengthened by the information-revolution. These changes are occurring in the organization and direction of

production, in commerce as well as in the system of transportation and individual occupational mobility. The computer has given a new impetus to the automatization of production processes. It increased the *productivity of work* and opened a new chapter in the machine age. *As a consequence, the new technology of the organization of work is finally destroying* the crumbling fences of national economies. The workplace of the craftsman, farmer, the intellectual — even if he works in the smallest village, – is becoming part of the world market. His ability to accomplish his work, his successes, the artefacts that he produces, are being measured by world market standards. The radius of interests and the mobility of the individual have increased almost without limits.

The spread of the information revolution upgrades the role of the knowledge-industry and of the intellectuals involved in research and development. History is no longer being studied as merely the story of inter-cultural relations, but the history of possessing information. (As the process of storing, transmitting and using information.) The computer has increased the possibilities and need for the application of scientific information manifold. As a consequence, a really large scientific industry emerged and stands in support of production. This is the large industry of information-technology. The information revolution, in turn, demands the work of local intellectual experts who are capable of surveying complicated systems and can develop corresponding local organizations. It needs intellectuals capable of using the new means available.

Information and knowledge are not only the propelling forces of productivity, but they are, at the same time, the creators of new *political values* in a much more effective way than any of their predecessors. The newest means of power, following immediately after military forces, money, and state offices, is knowledge (and its scientific institutions). It is the condition of human fulfilment.

The value-creating property of knowledge also increases the power of the *institutions of knowledge.* One of the lessons to be derived from the development of our age is that social economic progress always begin with the dynamic growth of research and education.

The technical-technological, cultural and political components of change have been present in the everyday life of civil societies for decades. However, for the first time, the penetration of new world-forces is also seen to overwhelm our region. We must admit that we have been unprepared for them.

Informational society brings new challenges in the practices of scholarship, in the knowledge-industry. Information as technology poses questions not only for the organization of production, but also for science education, and for the current practices in the organization of scholarship. With the help of a computer placed on his desk, and his access to the internet, a person can individualize the acquisition and transmission of scientific knowledge. The explosive growth of information transmission, the fast acquisition of global perspectives has created competition previously unheard of in scientific research. It accelerated the pro-

duction of printed means of knowledge (books, journals), and created a new culture of the transmission of knowledge, the electronic publication systems. It also created a revolution in the storing of data; one can store library-sized data on the disk shelves of one's study.

Research practices are also in the process of transformation, although this process cannot yet be fully understood. It is evident, however, that the conditions and possibilities for research are creating changes in the acquisition of knowledge. The internal system of scientific thinking is also being altered. We must re-evaluate the centuries-old methods of our daily research activities. The hierarchy of individual steps of the process of learning – the collection of data, their verification, the assignation of their weight, conclusions, etc., – have become unbalanced. The limits of data collection have become almost unimaginably expanded. The mass results of the acquisition of data influence the goals of study, the selection of themes, even the creation of hypotheses. This process sometimes lures one into immersion in details. At the same time, it demands the ability to possess perspectives, to create a synthesis, more than ever before.

We must rethink the changing nature of the international relations of scientific research (committees, conferences, associations, etc.,) in securing the transmission and exchange of information. The organizational principles developed at the beginning of the 20th century are now facing immeasurable transformation. We cannot foresee the changes as yet, because the consideration for new systems of goals of research in general have not yet entered into our consciousness. We cannot yet predict the changes because the social organization capable of absorbing the new organizational techniques have not yet been created; we cannot yet fully use the means offered by the information revolution. However, we can observe that the *traditional knowledge- and exchange forums* continue to remain in existence. Part of them are becoming superceded by the data-bases of information exchange, another part of them – especially the individual exchange of opinions – can become even more goal-oriented, more effective.

Information Revolutions and the Revolution of the Culture of Interactions

After all this, I must state that the determining phenomenon of our age is the revolution of the culture of interactions. Only the means of this interaction is informatics. (As it is also merely a means of scientific practices.) These means are, however, determining factors; they rearrange the processes of human communication.

While developing this concept, we may observe the previous system of human communication. It calls attention to the role that informed human beings

have fulfilled in the past. In the possession of information human beings made decisions in matters of family, of production, of political community.

When studying the history of the culture of interactions, our perspective is being enlarged both in terms of the past and of the possible future. Men are social beings and human cultures could survive only when they formed sufficiently effective community organization. Neither the land, nor the wealth of nature, nor the ability to create technical means sustained human communities. The combination of these factors was an essential precondition for survival and continued living; the combination of *favourable natural conditions, brains to create tools and fortunate community organization* were essential.

In historical studies, we are searching for an explanation of the emergence of Europe (and the expansion of the Judeo-Christian cultural sphere). We are inclined to accept the idea that the Greek-Latin alphabet with its thirty-something letters (István Hajnal's explanation), which made possible the *transmission and storage of knowledge,* its preservation and use, in both vertical and horizontal ways, was an important ingredient. Horizontally, that is, at the same time; vertically, or consecutively, in traditions piled upon one another. There has been continuous contact directly with contemporaries, and indirectly with successors. This was relevant among artisans, peasants producers of foodstuffs, official, teachers and others. The alphabet and literacy based on it could easily be acquired and it was available for various social strata. Therefore, literacy was not creating casts in the long run. I would like to add to this thought; the Greek-Latin system of writing was efficient and effective, because it lived on in a social system in which mutuality and solidarity were basic factors. The renewal of this idea – in the Renaissance and Reformation and in the economic-social systems that developed at the time, – made it possible for literacy to move out of a closed social organism, the organism of the church. It moved out at first because of the appearance of cursive writing, then on account of the printing of books. The acquisition of knowledge and the secularization of its transmission made the application of knowledge a mass phenomenon. In this process, I identify three information revolutions;

1. The Organization of the Christian church. *I am inclined to date the first information revolution from the age of the building of the new Christian church organization* (9th – 10th centuries AD) I locate this revolution at the point of the introduction of the Latin alphabet, based on a relatively narrow circle of literates and a somewhat wider circle of readers. Similar rules were becoming common in the continent-wide culture of exchange, above all, the Ten Commandments. They created an institution that strictly defined human interrelations and the norms of social existence with its code of morals. The means of this revolution were the preaching and listening to the Gospels, the exact mechanism of accounting for the commandments. And the miraculous culture of community singing! Thus, the previous culture of communications was placed on an entirely new founda-

tion. (Its techniques included the system of writing of chronicles, and of documents.) In verbal culture the system of masses and the earlier ancient culture of interactions continued to exist in folk traditions.

2. Mass Education. I am inclined to consider the *spread of mass education to have been the second information revolution.* (19th century). This process was comprised of definite knowledge-hoops, norms of universal mass behavior, and knowledge units that were transmitted in classrooms. It established uniform strands of thought, moral values and practical knowledge in the thinking of society. It developed uniform norms of behavior and a system of signals, i.e. the national languages. In turn, the process brought about fundamental changes in daily communications, in mutual understanding. The technical beginnings of the process can be discovered in the printing of books (16th century).[(However, in this case, similarly to that of the 19th–20th century industrial-technological revolution, we have problems in determining the exact starting point and exclusive factors. Printing is "only" technology, but it is also part of the general intellectual revolution of the 14th–15th centuries. Further development was only possible through this means. Which one prompted the other? The printed word brought about the social practice of reading by the masses. (18th century)]. It encouraged the establishment of intellectual circles, the modern schools (19th century) with their modern curricula. The printed word created the mass culture of newspapers at the end of the 19th century. In turn, this became the social basis of the information revolution of our days.)]

3. The Age of Free Information Flow. *The development of the age of the third information revolution* is unfolding in our time. In my opinion, its essence is in the process by which the spread of information encounters no obstacles, it goes on outside all community organizations, – churches, schools, – it is obtainable by the individual and it can be transformed and modified by him. (The means for the process is the personal computer and everything else that comprises the area of information transmission.) The historical ordering of the process – from a strictly technical standpoint – begins with the invention of the chip – or, rather, from the invention of their fourth generation (1970). However, considering the information revolutions from a viewpoint of social and cultural history, I am inclined to think that the age of the spread of the radio- and the television set may be considered the beginning of the process. In other words, the beginnings could be the period of the 1930s–1960s, or the mechanization of mass verbal and pictorial transmission of knowledge. This opened new channels of information transmission, following the establishment of mass literacy and the introduction of daily newspapers. We must also mention the development of telephone communications, making dialogues at a distance possible, and its explosive expansion in the 1980s, 1990s. (The basis of which is the other technological miracle, the expansion of space research.)

We have not yet reached the end of the process. Today, researchers are speaking of a culture of the transmission of thinking which, with the help of transceivers inserted into one's head, make verbal or written communications unnecessary...

It is a fact that the information revolution of our age is based, as the previous ones, on new technologies of *transmitting, data-storing and processing* of knowledge. Similarly to previous information revolutions, the current process also makes knowledge available for ever widening circles of the masses. As in the previous cases, technology and society mutually stimulate each other. Not only is it the case that human beings shape technology according to their needs but, in turn, technology also shapes the thinking of human beings. The current information revolution provides avenues for the triumph of individualism in the culture of communications. With the help of the internet and e-mail (1992), we may acquire any source of information. (Just think about it; the internet is only seven years old, but nearly one-hundred million people in the U.S.A., fifty million in Europe and five-hundred thousand in Hungary are using it.) *Not only are we independent of the cultural transmission of the church, and also independent of the curricula of the school systems,* but we are no longer relying on the radio and television producers, and their programs. Human curiosity is really being enhanced at this time. (And we should add; we are confronted by, and must seriously consider societies that developed in different cultural spheres. While in the two-thousand year old Judeo-Christian cultural sphere there has always been an emphasis on curiosity, – even if in an organized way – other cultures moved in closed circles. Therefore, our culture has an advantage over the others. Today, however, the cosmopolitan citizen freely sails over the world of the internet. Such freedoms break up the ancient organizations of culture and create individual competition.)

Social Assimilation

The literature dealing with the transmission of information constantly reminds us that we must continuously examine the social impact of informatics. Today, the evaluation of the impact of the internet is balanced. Experts are clear about the conflicts that are, at this time, insoluble. For instance, they are aware of the unregulated nature of information transmission and the misuse of information. (My reaction as a student of society, not of "information transmission," tends to be that more reliance has to be placed on the mechanism of social self-regulation.) One must not bemoan the fact that the internet provides unlimited opportunities for the popularization of antisocial ideas, for the spread of thrash. On the contrary; emphasis must be placed on developing an educational and

nurturing system dedicated to high standards and which is humanitarian in character. We must not only stand up *against something*, but we must make society be interested and receptive to what we consider noble values.) The information revolution also raises questions about the political systems of the world. Are the current political elites capable of viewing the problems and worries of humanity in a truly global perspective? Because today's technology provides us with the possibility of combining technical-organizational processes worldwide. Are we capable of making responsible decisions when the opportunity arises to interfere, on the basis of the values of our own culture, in the political-social processes of peoples living in faraway cultures? Or, on what basis currently available organizations involved in political and economic integration (European Union, OECD, NATO, etc.,) determine the geographic limits of their activities? To pose a general question; *is mankind, as a community of human beings, capable of recognizing and influencing social processes,* and is sufficiently prepared for the task? Because the unification of a given region is not simply a matter for military, governmental and financial institutions, and it is not simply a technical task. For such a task there is a need for men familiar with the history of the multi-coloured development of mankind, men who are capable of reviewing the past and envisioning the future from the viewpoint of the entire human species! Men need a new type of knowledge of the world! A new type of ideology, a new historical perspective and understanding of the present. We need a new recognition of the relations between nature and mankind. We certainly rule over the technology that we had developed, but do we rule over ourselves?

Hungary 2000

We, who live in Hungary, must do everything possible in order to have our local society keep up with the evolution of the world. We should even be part of the ranks of those who shape this world, especially those of us who have the ability to do so. We must do everything possible to have Hungarian society absorb the means of information technology and assimilate the needs of the informational society to the greatest extent. (This volume serves the same purpose.

While preparing a summary of the change of regimes (at least the history of the 1990's) I would like to make three short comments and raise questions for further consideration. These are related to the adoption of the means of informatics and the foundation of informational society.

1. The Transformation of Communications. We must examine the relations between the means of information exchange and society much more extensively than before. The social sciences must pay closer attention to the "new themes." Currently, a great deal of publicity is being produced, but there is not enough

historical-sociological-cultural-anthropological analysis. As a consequence, there is a great deal of fear based on the centuries-old (or even a thousand years old) cultural communication.

There has been too much optimism in the minds of some people and, therefore, the disillusionment is also substantial. As a historian, my view is that there had existed different forms of information transmission and communication in the past besides mass-education. Similarly, there will remain other means for these tasks in the informational society, means that have been ours for centuries or thousands of years. For instance, I do not believe that electronic mail will replace traditional correspondence; articles published on the internet will not replace the reading of journals or books. I cannot believe that the free transfer of information will raise hundreds of millions of extroverted people. We will always have a personal life, jealously guarded emotions, and will always possess and attempt individual solutions to problems. Our actions will undoubtedly become more effective. Today, people do not report you directly to the police, they send reports on the internet. But, as I have mentioned above, I trust the self-correcting processes of society. (For instance, I believe that society will recognize the real intents behind brain washing technics. In other words, society will not believe everything it hears from politicians, newspapermen, or internet-knights.) This ability must be strengthened. Speaking from a historical perspective, every information revolution had changed previous forms and norms of communication. However, some of the old forms had proven to be enduring. Naturally, of the new forms some proved ephemeral, others more durable.

The process of the informational revolution had fulfilled a decidedly positive role in Hungary in the 1990s. It contributed to the strengthening of civic openness, which we lacked at the time of Soviet rule, (between 1949–1990) and even before the war. In other words, the spread of the means of informatics – I repeat – democratized society. Researchers are often surprised by the active adaptability of Hungarian society. I am inclined to believe that this characteristic is also an element of our general traditions, of the acceptance of other cultures. *We are a society always adaptable, curious and ready for renewal.* It is a fact that the import of the Commodore (computers) was significant in the private sphere in the 1980s, which was not very prosperous at that time. The statistics of private PC acquisitions, the "fashion of computers," are also astounding in the 1990s. Our foreign colleagues cannot explain the fact that the per capita possession of mobile telephones placed Hungarians in the forefront of world statistics in the last few years. (Hungarians who are, in general, poor, are distinguished by their willingness to buy such a luxury article!) Hungarian society is surprisingly open for new trends, for more knowledge. (I am also willing to explain the four-hour per capita average daily television viewing in a positive way, as hunger for information. We are listed among the top ranks in this in world statistics as well.)

2. Preference for Research and Higher Education. In the first half of the 1990s, our institutions of university research had deteriorated. It is true that there was no witch hunt at the universities and at the Academy of Sciences, but there was a lack of reform-mindedness for the assimilation of the new industrial-technological revolution. There were successes following the reform (1997), whose goal was the improvement of basic conditions for scientific endeavours. However, we are now facing the necessity of the reform of the infrastructure and of the compensation system. If these are postponed, then we will be facing the failure of our previous efforts. The basic question raised in institutions of elite culture today is, whether salary improvements will be implemented or computers will be acquired. The results are usually temporary solutions. The state must decide; either it will provide adequate funds for compensation in the sphere of university research and infrastructure, or the higher education of the country's elite will lose out of the implementation of the blessings of the industrial-technological revolution.

3. The Increase of Social Inequality. One of the argument presented by the already numerous critics of the information revolution is that the means of informatics have not brought about cultural equality. On the contrary, it increased inequality. This is quite true. The reason is that the price of a personal computer and of its components is steep and only a constantly narrower segment of the population is able to pay for them. Consequently, the cultural gap is increasing. According to another criticism, trash literature is cheap and is therefore constantly expanding. (I already stated my opinion on that score.) Let us take a short look at the first criticism.

Previous information revolutions have, in their beginning phases, also increased the cultural gap. The spread of literacy upgraded the size of a reading stratum (in the 16th–17th centuries.), which had education and money to buy books and time to read them. Their language and thinking rose far above those of the poor than at any other time. However, printing had provided the opportunity for the mass duplication of reading material and for the education of the masses. (In the 19th century.) These were realized by the use of the funds of the community – through the efforts of the state, – on the basis of the principle of solidarity. In other words, society developed the mechanism for establishing a balance. (At least in the Judeo-Christian culture, one of whose basic principle has been, at least until recently, solidarity.)

A basic question in our age is; "Can the community, the state, assure the availability of the new techniques for the masses?" It would have to use the funds dedicated to cultural policy, through state-financed general education. (One of the preferences of cultural policy in 1989–1990 was just that. After the appearance of the internet, a pioneering plan, called school-net, was introduced. But it remained an isolated idea and was later abandoned.) European society in general and Hungary in particular must decide if they want to spend funds for

the establishment of new schools from the taxes of the community. This is the basis for the new generations growing up on the European continent to be competitive in the productive-cultural world market. This is also a condition for Hungarian children to become cultural carriers answering the demands of the information revolution, adjusted to Hungarian culture, in the 21st century. The modernization of the culture of our mother tongue and the competitiveness of our thinking-production capacity are closely related phenomena.

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Industrial-technological revolution, social and intellectual revolution. Their heroes are not agitators, eloquent public speakers. They are the men and women undertaking and willingly accepting quiet, daily labours, competition and continuous self-education. They are agriculturists who accept innovations, craftsmen among whom I grew up. They are those whose movements are attached to their tools, and the tools to fit their movements. They have adjusted to circumstances and to each other. I grew up among them, the experimenters, teachers and researchers, driven by an ardent desire to acquire knowledge. They have assimilated the knowledge of their masters and transmitted it to their students. I see and greet them every day; they are economists and officials, who do no more than service and maintain, and improve, through thousands of small innovations the conditions of worldly existence. They continue to believe that they, carriers of the results of technology, are working in our interests.